

Focus. . . Short Maternal and Infant Hospital Stays and Neonatal Rehospitalization

The length of hospitalizations for new mothers and their infants has decreased substantially in recent years. Between 1980 and 1993, the percentage of infants born in U. S. non-federal hospitals who were discharged after less than two days increased from 8.9 percent to 30.1 percent¹. The average length of hospitalization for newborns decreased from 4.3 days to 3.1 days over that period. In recent years, the force behind this shortening of hospital stays has been the increasing presence of managed care and the effort to control health care costs. Managed care organizations are compelled to minimize health care costs by reducing the use of services that are not cost-efficient. To this end, many managed care groups only pay for one night's hospital stay following a normal delivery of an apparently healthy baby. Reaction to these policies has been strong and unfavorable, and has drawn the attention of the media and state and national legislatures. Missouri is one of a number of states which passed legislation in 1995-96 requiring insurers to cover a minimum stay for new mothers and their infants. The Missouri law says that insurers must cover inpatient care for the mother and child for 48 hours following a vaginal delivery and 96 hours following a cesarean section². If a woman chooses to leave the hospital early, insurers are required to cover home follow-up by a health professional. A similar bill exists in the U. S. Senate.

Opponents of early discharges following delivery argue the following³:

- Stays of at least two days will allow more extended professional observation of the newborns' health. Several conditions, notably jaundice, may not manifest themselves until the infant's second or third day of life.
- Infections and complications of obstetric wounds may not manifest until after a few days.
- Early discharges reduce the amount of time the new mother has in the hospital to learn and receive support for healthy behaviors. Because many women have not begun lactating by the end of the first day, breastfeeding rates, which are already low, may decline further because of the inaccessibility of knowledgeable support when lactation does begin.
- Many women may require the recuperation time in the hospital to make the emotional adjustments to their new role before returning to the pressures of the home.
- Current practices for screening newborns for several metabolic diseases are not valid unless they are performed at least 24 hours after the infant's first feeding. If the infant leaves the hospital before an acceptable sample can be collected and no re-sample is obtained, cases will go undetected until they cause health problems, resulting in much greater risks and costs than if they were detected through routine screening.

Insurers have argued that there are a number of studies that have evaluated the effect of early discharge, and none has found significant risk associated with the shorter hospitalizations³. These studies have focused on select populations and usually included special post-discharge follow-up for the mothers and infants. It is difficult to interpret how these findings should be applied to the wider population of mothers and newborns. To address this problem, the Missouri Department of Health conducted a study which examined hospital records for infants born in Missouri hospitals in 1993. The study looks at the prevalence and effects of short hospitalizations for new mothers and their infants in the period before the application of the new state law. The Department of Health will continue surveillance of these hospitalizations and their relationship to the health of mothers and babies after the law takes effect to evaluate the impact of the law.

Patient abstract records for all inpatients aged 14 days or less at the time of admission were linked to the patient's birth certificate and to the patient abstract record from their birth hospitalization. Infants that were transferred directly from one hospital to another account for 69 percent of admissions for babies in the first week after discharge. The analysis that follows considers only infants who were discharged directly to home care from their natal hospitalizations.

Table 1 shows the average length of stay and the percentages of the hospitalizations that were shorter than 48 hours for vaginally-delivered infants or 96 hours for C-section infants. Overall, 66.5 percent of natal hospitalizations were shorter than those stipulated by the new law. (The reason this number appears to be much higher than the national percentage of stays that are less than 2 days — 30.1 percent, cited above — is that, by measuring the stay in days, the national figures cover up some short stays. A hospitalization could be as short as 25 hours and still be considered two days long. The percentage of Missouri natal hospitalizations that were less than two days long was 29.6.) Short natal stays occurred in all hospitals that had at least 30 births during the period, but were more common in some than others.

The negative associations of short stays with lower maternal age and education, unmarried mothers, and mothers who received inadequate prenatal care might indicate that decision-makers are considering these indicators of risk to the infants' health before deciding whether to discharge infants early. Alternatively, these infants might have experienced longer stays because they had poorer health status already at the time that a decision was being made about possible early discharge. The small difference in the probability of early discharge between firstborn children and those of higher birth order contrasts with the larger differences for other high-risk characteristics. Presumably, first-time mothers could benefit more from greater access to education and support from nurses — including training on breast- or bottle-feeding, care of the umbilicus, and what to be prepared for in the care of a new baby.

Cesarean deliveries are predictably related to longer natal hospitalizations, but "early" discharges are more frequent among cesarean deliveries because of the different criterion for c-section births. Media coverage has been focused mostly on short stays after vaginal births, and it may be that c-section stays of less than 96 hours are less unpopular among physicians and patients than the brief stays following vaginal deliveries. Regardless of method of delivery, low birth weight is associated with much longer hospitalizations than normal birth weight. Average length of stay is also significantly increased for children of African-American mothers and children whose mothers were enrolled in Medicaid, for both vaginal and cesarean deliveries.

Of all the infants who were discharged to home care within seven days of birth, 1.0 percent were readmitted into a hospital within the first week after discharge (Table 2). Readmission rates were significantly elevated among male infants, firstborn infants, children of teen mothers, and children of Medicaid enrollees. Also, infants born by vaginal delivery were readmitted more frequently than those born by cesarean. By far the most common principal diagnosis upon readmission was jaundice, followed by infections and respiratory problems.

Infants who were discharged early from their natal hospital were not more likely to be rehospitalized than the infants who stayed longer, regardless of the method of delivery (Table 3). Adjusting for the infants' birth weights (in addition to delivery method) did not affect the direction or the statistical significance of the differences shown. There was no apparent difference in the most common principal diagnoses between early and later discharges. Jaundice was cited in 39.5 percent of readmissions after short stays, and 37.8 percent of readmissions after longer natal stays. The top three diagnoses accounted for 54.1 and 52.7 percent of readmissions after short and longer stays, respectively.

Examination of newborn metabolic screening records shows that early neonatal discharges do have an effect on whether screenings are timed appropriately. In the fourth quarter of 1994, 76 percent of screening samples which were collected too early were from infants discharged after less than 48 hours of life, compared to 43 percent of appropriately timed samples. A repeat sample is required to replace each inappropriate sample, but only 52 percent of short-stay infants and 43 percent of longer-stay infants have re-samples taken within the one week required by law. Although the early discharge infants with inappropriate first samples are significantly more likely to be resampled than those discharged later, there would be a smaller absolute number of missed screenings (inappropriate initial screenings without follow-up) if the longer stay rates applied to all infants (about 1,660 missed screenings expected for Oct. 94 - Dec. 94 vs. 2,411 observed.)

In summary, short natal hospitalizations have become common in Missouri. The new law requiring insurers to cover minimum stays will go into effect in August, 1996, with all affected plans expected to be in compliance by January, 1997. Its effect will be to distribute the cost of longer hospitalizations for mothers and their infants among all managed care consumers, or in the case of mothers on public medical assistance, among all taxpayers. The data that are currently available do not allow the Department of Health to evaluate the law's effect on breastfeeding rates or mothers' satisfaction with the care they receive during their delivery hospitalization. This study indicates that we should not expect a decrease in infant re-hospitalizations to result from the implementation of the new law, but that the quality of newborn screenings for metabolic disorders should be improved.

Sources:

1 Centers for Disease Control and Prevention. "National Hospital Discharge Survey: Annual Summary, 1993." *Vital and Health Statistics*. Series 13 : #121. 1995.

2 RSMO 376.1210

3 Braveman, P., et al. Early Discharge of Newborns and Mothers: A Critical Review of the Literature." *Pediatrics*. 96(4): 716-726. 1995.

Table 1 Average Length of Stay and Percent of Stays that were "Short" by Delivery Method Infants Born in Missouri Hospitals and Discharged to Home Care: 1993					
	<i>Vaginal Deliveries</i>		<i>Cesarean Sections</i>		
	<i>Number</i>	<i>Mean LOS (hours)</i>	<i>Number</i>	<i>Mean LOS (hours)</i>	<i>Percent With Short Stay*</i>
Total	54,254	57.3	15,020	118.3	66.5%
Race					
White	39,490	53.5	11,766	113.8	70.5%
African-American	7,731	78.9	1,668	160.5	45.2%
Infant Sex					
Male	27,435	58.5	8,094	114.8	65.5%
Female	26,818	56.1	6,926	122.3	67.5%
Parity					
1	21,636	60.3	6,399	113.8	65.3%
2 or More	32,618	55.4	8,621	121.6	67.3%
Age					
Under 20	8,384	65.1	1,482	134.3	59.0%
20 and over	45,870	55.9	13,538	116.5	67.7%
Education					
< 12 yrs.	11,498	66.5	2,454	135.2	59.0%

12 yrs. or more	42,756	54.8	12,566	115.0	68.4%
Married					
Yes	35,714	52.0	10,833	110.8	67.2%
No	18,540	67.7	4,187	137.6	56.7%
Prenatal Care					
Adequate	44,483	53.9	12,997	112.7	69.0%
Inadequate	8,739	73.6	1,708	148.0	53.6%
Medicaid					
Yes	22,736	64.1	5,500	134.1	59.2%
No	31,406	54.2	9,497	109.1	71.6%
Birth weight					
<2500 g	2,960	234.4	1,488	434.1	28.2%
≥2500 g	51,294	47.1	13,532	83.6	69.1%
* Stays of less than 48 hours after vaginal delivery or less than 96 hours after C-section are classified as "short".					

Table 2 Percent of Infants Readmitted into Hospital within 7 Days of Discharge Infants Born in Missouri Hospitals and Discharged to Home Care by Age 7 Days: 1993		
	<i>Number</i>	<i>Readmission Rate</i>
Total	67,039	1.0%
Race		
White	49,844	1.1%
African-American	8,732	0.7%
Infant Sex		
Male	34,323	1.2%
Female	32,716	0.9%
Parity		
1	26,726	1.2%

2 or More	39,504	0.9%
Age		
Under 20	9,313	1.4%
20 and over	56,917	1.0%
Education		
< 12 yrs.	13,115	1.1%
12 yrs. or more	53,114	1.0%
Married		
Yes	44,995	1.1%
No	21,234	1.0%
Prenatal Care		
Adequate	55,293	1.1%
Inadequate	9,701	1.0%
Medicaid		
Yes	26,590	1.2%
No	39,508	0.9%
Delivery		
Vaginal	52,465	1.2%
Cesarean Section	13,764	0.6%
Birth Weight		
<2500 g	2,597	1.6%
≥2500 g	63,632	1.0%

Table 3 Percent Readmitted within 7 Days of Discharge from Birth Hospitalization by Length of Natal Hospitalization* Infants Born in Missouri Hospitals and Discharged to Home Care by Age 7 Days: 1993						
	<i>Number</i>	<i>Early* Discharge Percent Readmitted</i>	<i>Number</i>	<i>Later Discharge Percent Readmitted</i>	<i>Number</i>	<i>Total Percent Readmitted</i>
Total	46,061	1.0%	23,213	1.1%	69,274	1.0%
Vaginal Births	34,403	1.1%	19,851	1.2%	54,254	1.1%

Cesarean Births	11,658	0.6%	3,362	0.4%	15,020	0.6%
* Discharges less than 48 hours after vaginal delivery or less than 96 hours after C-section are classified as "early"						

Provisional Vital Statistics for April 1996

Live births decreased in April as 5,598 Missouri babies were born compared with 5,869 in April 1995. The monthly birth rate decreased from 13.1 to 12.8 per 1,000 live births between these two time periods.

Cumulative births for the 4- and 12-month periods ending with April also decreased. During the first third of the year 24,306 babies were born compared with 24,855 in 1995.

Deaths decreased in April from 4,866 to 4,379, to show slight increases for the cumulative 4- and 12-month periods ending with April.

The Natural increase for Missouri in April was 1,219 (5,598 births minus 4,379 deaths). The rate of natural increase rose from 2.2 in 1995 to 2.8 in 1996.

Marriages increased in April as 3,057 couples married compared to 2,711 one year earlier. Cumulative marriages for the 4- and 12-month periods ending with April both show decreases.

Dissolutions of marriage increased in April and 2,309 marriages dissolved compared with 1,909 in April 1995.

Infant deaths increased in April and the first third of the year, but continue to show a decrease for the 12 months ending with April.

Provisional Resident Vital Statistics for the State of Missouri

Item	April				Jan.-April cumulative				12 months ending with April				
	Number		Rate*		Number		Rate*		Number		Rate*		
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996	1994	1995	1996
Live Births	5,869	5,598	13.1	12.8	24,855	24,306	14.0	13.7	74,632	73,026	14.4	14.1	13.7
Deaths	4,866	4,379	10.8	10.0	19,528	19,795	11.0	11.2	53,741	54,136	10.3	10.2	10.2
Natural increase	1,003	1,219	2.2	2.8	5,327	4,511	3.0	2.5	20,891	18,890	4.1	3.9	3.5
Marriages	2,711	3,057	6.0	7.0	11,342	11,113	6.4	6.3	45,476	44,650	8.5	8.6	8.4
Dissolutions	1,909	2,309	4.2	5.3	9,124	9,094	5.2	5.1	26,637	26,814	5.1	5.0	5.0
Infant deaths	45	62	7.7	10.5	194	202	7.8	8.1	586	561	7.9	7.9	7.7
Population base (in thousands)	...	...	5,323	5,352	...	...	5,323	5,352	...	...	5,249	5,205	5,333

*Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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